



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/559,347 | 04/27/2000 | Qixu David Chen | 146712000400 | 2901 |

25227 7590 09/27/2002

MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 300
MCLEAN, VA 22102

EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 09/27/2002

19

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------|--------------------------------------|------------------------------------|--|
| Advisory Action | Application No. 09/559,347 | Applicant(s) CHEN ET AL. | |
| | Examiner Kevin M Bernatz | Art Unit 1773 | |

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 12 September 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. **ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).**

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☒ The proposed amendment(s) will not be entered because:
- (a) ☒ they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) ☐ they raise the issue of new matter (see Note below);
 - (c) ☒ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See Continuation Sheet.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☒ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☒ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: none.

Claim(s) objected to: none.

Claim(s) rejected: 2,3,8,9,11,12,17,18 and 21-25.

Claim(s) withdrawn from consideration: _____.

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.
10. ☒ Other: see attached interview summaries (2) (part of Paper No. 19).

Continuation of 2. NOTE: the prior claims were not limited to a minimum thickness of 100 Angstroms as now proposed, and would now require further search and/or consideration.

Continuation of 5. does NOT place the application in condition for allowance because: applicants' declaration and request for reconsideration are directed to two separate arguments, neither of which the examiner deems are convincing to overcome the rejections of record. The two arguments are that the textured NiNb layer would not inherently prevent the migration of Li ions from the substrate to the top of the magnetic layer and that a range in thickness of 100 - 450 Angstroms would be unexpected to one of ordinary skill in the art to provide sufficient prevention of ion migration.

Regarding the argument that the textured NiNb layer would not inherently prevent the migration of Li ions, applicants' have submitted a declaration by Dr. Ross in support of the position that laser texturing would disrupt the sealing ability of the NiNb and, therefor, not inherently prevent the migration of Li ions to the surface of the magnetic layer. The examiner respectfully disagrees.

The examiner has carefully reviewed and considered the declaration of Dr. Ross, but finds it unconvincing. Specifically, the examiner notes that the NiNb layer deposited by the method disclosed in Ross et al. ('997) would result in a uniform NiNb layer across the entire substrate where the textured "bumps" only go through the top portion of the layer (see Figure 1C - portion of layer 118 closest to layer 114). Dr. Ross provides additional evidence of such a uniform portion of the NiNb layer in the attached paper titled "A method for laser zone texturing ... using Nd:YAG lasers" in Figure 7 ("Figure 7, shows the Ni-Nb film to be smooth and featureless (no voids or columnar structure), consistent with a dense amorphous film. The Ni-Nb film does not influence the properties or magnetic performance of the subsequently deposited CoCrPt film"). In addition, the declaration provided by Dr. Ross is not convincing that the NiNb layer would not inherently prevent ion migration because Dr. Ross admits that the effects are unknown ("Moreover, the process of laser texturing, in which the NiNb layer is exposed to a laser beam, may adversely affect the diffusion barrier properties of the layer" (paragraph 9)). Applicants are reminded that the Office need not have factual evidence that a property is inherent, but must present a sound basis for believing that the products of the applicant and the prior art possess the same limitations. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). In the instant case, because the textured NiNb layer is made of a material known to prevent the migration of Li ions (as taught by applicants) and the texturing is known to leave a uniform portion of the layer untextured (as shown in Ross et al. '997 and Dr. Ross's declaration), the Office deems that sound basis for the position of inherency exists for the textured NiNb layer preventing the migration of Li ions to the surface of the magnetic layer.

Regarding the argument of unexpected results based on the thickness of the NiNb layer, the examiner has carefully reviewed and considered the declaration of Dr. Ross, but does not find it convincing. The declaration of Dr. Ross cites applicants' data in Table 1 as evidence that the NiNb layer is the critical element for preventing the migration of Li to the surface of the magnetic layer. Dr. Ross also states that "it is clear that the NiNb is the active material in the diffusion barrier, while the CrMo/CoCrPtTa/C has little effect on the diffusion". The examiner respectfully disagrees.

The examiner notes that applicants' data in Table 1 (page 16) is directed to surface-oxidized NiNb only. Furthermore, there is no evidence as to the amount of Li ions that would migrate to the surface if the CrMo and C layers were not present, so while the NiNb may additionally reduce the migration of Li, the relative magnitude is not known. E.g. the 63 nm thick stack of CrMo/CoCrPtTa/C allows 2700 counts/min of Li to diffuse to the top of the film stack. Would the counts/min of just a CoCrPtTa film be also 2700? Or would it be 270,000, so that the CrMo + C film reduces the ion migration by a factor of 10? There is insufficient evidence for a determination of the impact the CrMo and C have on the Li ion migration. Furthermore, the examiner cites the related case Huang et al. (U.S. Patent No. 6,416,881 B1; Figure 7) which clearly shows that the C and lubricant layer have an impact on ion migration (in '881, Co and Ni ions). While the examiner acknowledges that Li ions will migrate differently than Ni or Co due to the relative size difference, the fact that the C layer is shown to impact the Co and Ni ion migration provides reasonable basis for one of ordinary skill in the art to postulate that the C and lubricant layer may also impact the Li ion migration.

Applicants' further argue in their request for reconsideration that the data shown in Table 1 supports a position of unexpected results when using a thin NiNb layer, thereby distinguishing the present invention from the prior art of record. The examiner respectfully disagrees.

The examiner does not find applicants' arguments convincing for the reasons discussed above, and in addition for the reason that the claims are not commensurate in scope with the argued unexpected results. In particular, the claims do not recite "to less than 500 counts/minute", as argued by applicants, but merely refer to "substantially preventing the migration of Li". While substantially is not indefinite, it must be given a broad interpretation since the specification does not explicitly state that substantially means "less than 500 counts/minute" (i.e. is reduction to 2700 counts/min from just the CrMo/CoCrPtTa/C film stack a "substantial" prevention of Li ion migration in and of itself?). Furthermore, the examiner notes that the disclosed data is for an oxidized NiNb layer and for only a single composition of NiNb (i.e. 40.5% Nb). As discussed above, the examiner deems that the alloys and thickness values of each layer above the NiNb layer will reduce the counts/minute to some degree, and are therefor contributing factors towards achieving the argued, but unclaimed, value of "less than 500 counts/minute". As such, the examiner does not find applicants' arguments of unexpected result for the proposed thickness range to be convincing.



Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700